

Cell Membranes & Permeability

Name: _____ Date: _____

Group Role: _____ Section: _____

Essential Questions

Can all substances move in both directions through a cell membrane?

Why do some substances enter the cell through the cell membrane, while others do not?

Problem: How does the cell membrane work?

Materials

Plastic lunch bag
starch solution
iodine
beaker
water
test tube

Safety

Iodine is poisonous. Keep it away from your face, and wash your hands thoroughly after using it. Iodine will stain your hands and clothing, so be careful not to spill it. Handle glass objects carefully. If they break, tell the teacher. Do not pick up broken glass.

Model of a Cell Membrane:

Day 1

1. Write your name on a beaker with masking tape. Label 2 test tubes at the top with masking tape, one with starch and the other with iodine.
2. Fill the beaker with 40 mL of Iodine solution. Record the color of the iodine in the data table. The iodine solution represents the environment outside the cell.
3. Fill the test tube labeled "Iodine" 1/4 full of iodine solution. Place it in the beaker.

4. Fill a plastic lunch bag with 40mL of starch solution, and seal the bag. Be careful not to spill the starch onto the outside of the bag. Record the color of the solution in the data table. Place the bag in the solution in the beaker. The bag represents the cell.
5. Fill the starch test tube with 1/4 full of starch solution, record the color of the solution in the data table and then place the test tube in the beaker.
6. Let the beaker sit overnight.

Day 2

1. Remove the plastic bag and the test tube from the beaker. Record the colors of the solutions in the data table.
2. Dispose of the solutions and clean the test tubes and beaker appropriately and carefully.

Solution	Color - Day 1	Color - Day 2
Starch in model cell		
Starch in test tube		
Iodine in test tube		
Iodine in beaker		

Analyze

1. What part of the cell does the plastic bag represent?
2. What was the purpose of placing the test tube containing starch solution in the beaker of iodine?
3. When starch mixes with iodine, the mixture turns blue. What can you infer about the contents of the plastic bag?
4. Did starch move out of the bag? Give evidence to support your claim.
5. Did iodine move into the bag? Give evidence to support your claim.
6. Based on your results, was the model cell membrane permeable or impermeable to iodine? To starch?

Conclude

7. Describe how this model compares to the egg model.

8. Was the egg model cell membrane permeable or impermeable to water? Salt water?

9. What form of transport did these two models demonstrate? Be specific when discussing water or other substances.

10. Create a different model to represent a cell membrane during active transport.